Using Writing and Mathematics Portfolios to Improve Student Learning

I. Vision

Historically, writing and mathematics portfolios have undergone a number of changes in their use as an instructional and assessment tool in Vermont classrooms. The one constant belief throughout these changes, however, has been that portfolios can play an integral role as a best practice in *improving student learning.* In this document, the Vermont Department of Education seeks to promote a vision for the use of portfolios which will support teachers in answering crucial questions such as, *How do I know my students are becoming effective writers and problem solvers?*

Many Vermont teachers and administrators have recognized the value of the portfolio as a powerful instructional and assessment tool. Inherent in the nature of the portfolio process are opportunities to incorporate the principles of *formative assessment for learning* into instruction:

- clarifying the criteria for success,
- guiding meaningful discussions and questions,
- moving learners forward with feedback,
- peer and self-assessment, and
- on-going reflection on learning.

When these strategies are incorporated into the portfolio process, the portfolio becomes a means for supporting students in becoming capable writers and problem solvers, as well as a tool for assessing student growth. These strategies play an important role in ensuring the portfolio process does not lead to unintended consequences: formulaic writing without meaningful content and isolated, rather than embedded, problem-solving practices.

The Vermont Department of Education seeks to promote a vision in which local schools and districts use mathematics and writing portfolios as instructional and assessment tools to support students in becoming effective problem-solvers and writers. To this end, the following document outlines mathematics and writing resources available to teachers, as well as classroom models and suggestions for using portfolios.

Please pay special attention to the *change in the available calibration resources*. The Department will no longer sponsor online calibration or electronic scoring. Instead, the calibration sets, true scores, and rationales will be sent directly to principals and curriculum coordinators on a CD, so that they are available for local use by teachers and administrators throughout the year. The calibration sets offer numerous possibilities for supporting teachers in practicing reliability in their scoring, as well as opportunities to define professional development needs.

THIS DOCUMENT IS INTENDED TO BE SHARED AMONG AND WITHIN SCHOOLS.

II. Department of Education Resources for Mathematics and Writing

http://www.state.vt.us/educ/new/html/pgm.curriculum.html
Follow the links to Mathematics and Literacy.

Mathematics lisalovelette@education.state.vt.us	**Writing** martygephart@education.state.vt.us
Mathematics network meetings (VPDN), December and April	Literacy network meetings (VPDN), September and March
Mathematics benchmarks and achievement levels: • Grades K, 1, 2 Available December 2006: • Grades 3 and 4	Writing benchmarks and rubrics: • Grades 4, 5, 8, 10 on-line • Grades 1, 2, 3 upon request
Mathematics training/calibration pieces/sets and rationales available November 2006: • Sent to schools on a CD for **local use** (no calibration online) • Grades K, 1, 3, 5, 7, 10 Available September 2007: • Grades 2, 4, 6, 8, 9	Writing training/calibration pieces/sets November 2006: • Sent to schools on a CD for **local use** (no calibration online) • Grades 4 (3 genres only), 5, and 8 Available September 2007: • Grades 2, 6, and 10
April 2006 calibration sets available for downloading and local use	November 2005 and April 2006 past calibration sets available for downloading and local use
Mathematics Portfolio Data Analysis Tool online	Writing Portfolio Data Analysis Tool online: • 3 genres • 4 genres (not yet available) • 6 genres

III. Models/Suggestions to Enhance Student Learning and Professional Development Opportunities in WRITING

A. Clarifying the criteria for success:

- *Fewer genres* instructed at the K-4 level (responses, reports, narratives) to reinforce the internalization of the writing dimensions (Standard 1.5 – purpose, organization, details, voice/tone)

- *Cross-grade and cross-content conversations* to empower teachers to examine effective instructional practices

- Regular, collaborative *examination of student work* by teachers; local scoring teams used for professional development

- *Calibration sets* used locally to ensure validity and reliability of reported scores

B. Guiding effective discussions and questioning:

- *Content* considered when determining the effectiveness of writing

- Writing used consistently to assess whether students have the "big ideas" of content

- *Constructed response* (paragraph) writing embedded across the content areas and used formatively to assess content knowledge and writing structures

- Frequent *short writing/free-writing* to increase fluency with language in addition to structures and graphic organizers; writing notebooks used as a "habit of the mind"

- On-demand writing embedded in content

C. Moving learners forward with feedback:

- *Comment-only marking* (referenced to writing dimensions) on all student work; students select best pieces for grading at specific intervals

D. Peer and self-assessment / on-going reflection on learning:

- A reflective piece of writing included in the portfolio in which the student *self-assesses* his/her strengths as a writer and sets goals for future work

- *Prewriting, organizers and previous drafts* added to finished pieces to show evidence of writing process

- *Poetry* included in the portfolio but not scored

IV. Models/Suggestions to Enhance Student Learning and Professional Development Opportunities in MATHEMATICS

A. Classroom Instruction/Formative Assessment:

- *Embed Problem Solving in Daily Instruction*
  Unlike many of the mathematics programs schools were using when portfolios were introduced onto the Vermont landscape in the 90s, the programs in use in Vermont schools today place major emphasis on solving problems, sharing solutions, and justifying thinking. Problem solving is an integral part of all mathematics learning and should not be an isolated part, or "add-on," to the classroom program.

  In grade level teams, select and embed instructional problem solving tasks in each mathematics unit. Review student work and provide specific feedback to each student which outlines what s/he needs to do to improve (no score). Select benchmark pieces from the student work to use for instructional purposes.

- *Use the Language of the Portfolio Rubric in Classroom Discussions*
  Children benefit from consistency in language when they are engaged in discussions and are learning/refining their skills in communicating their strategies and approaches to solving a problem. The language of the portfolio rubric provides an excellent framework for daily discussions:

  Approach and Reasoning Questions:
  What was your approach to solving this problem? Did it work?
  Connections Questions:
  Is there a different way to solve this problem?
  Solution Questions:
  Did your solution work?
  Mathematical Language Questions:
  What mathematical terms did you use when explaining your solution?
  Mathematical Representation Questions:
  Did you use any graphs, charts, tables or models when you solved this problem?
  Mathematical Documentation Questions:
  Is it clear how you solved this problem and why you solved it as you did?

B. Local Assessment and Analysis:

- *Create Common Grade Level, On-Demand, Problem Solving Tasks*
  In grade level teams, select an on demand problem solving task for each unit in the mathematics program. Individual teachers score students' work. With grade level colleagues, double score a percentage of the pieces. Review data to gain student information as well as information about the program and professional development needs.

- *School-wide Calibration*
  The calibration sets available on the Department of Education's website are an excellent resource to ensure grade level teams' scoring is reliable. The sets may be downloaded as needed (i.e., teams might choose to score a geometry piece prior to teaching a geometry unit) or may be downloaded in its entirety and used to define professional development needs.

- *Mathematics Data Analysis Tool*
  Utilize the Mathematics Data Analysis Tool available on the Department of Education website to track individual or class progress on the common grade level, on-demand tasks. This data can be used for local assessment reporting purposes.